

WHAT IS CLAIMED IS:

1. A monolithic multiple-wavelength laser device comprising a laser section of a first wavelength and a laser section of a second wavelength formed on a surface of a single GaAs substrate, wherein said laser section of the first wavelength includes a real guide structure and said laser section of the second wavelength includes a loss guide structure.

2. The monolithic multiple-wavelength laser device according to claim 1, wherein a burying layer on either side of a ridge portion included in said laser section of the first wavelength is formed with a three-layer structure including a GaAs layer having a thickness of more than 0.03 μm and less than 0.05 μm , an AlGaAs layer having a thickness of more than 0.05 μm and less than 0.1 μm , and an insulative dielectric film having a refractive index lower than that of said ridge portion.

3. The monolithic multiple-wavelength laser device according to claim 2, wherein said insulative dielectric film has a refractive index in a range of 1 to 2.

4. The monolithic multiple-wavelength laser device according to claim 2, wherein said insulative dielectric film having a low refractive index is made of a silicon nitride film or a silicon oxide film.

5. The monolithic multiple-wavelength laser device according to claim 2, wherein said insulative dielectric film having a low refractive index has a thickness in a range of 0.1 μm to 0.2 μm .

6. The monolithic multiple-wavelength laser device according to claim 1, wherein the surface of said GaAs substrate has an off-angle in a range of 5° to 25° from a (001) plane toward a [110] direction.

7. A method of fabricating the monolithic multiple-wavelength

laser device of claim 1, wherein said insulative dielectric film having a low refractive index is formed at a film deposition temperature in a range of 150°C to 400°C.

8. The method of fabricating the monolithic multiple-wavelength laser device according to claim 7, wherein said film deposition temperature of said insulative dielectric film having a low refractive index is in a range of 150°C to 250°C.

9. The method of fabricating the monolithic multiple-wavelength laser device according to claim 7, wherein

the ridge portion included in said laser section of the first wavelength and a ridge portion included in said laser section of the second wavelength are both buried in a multi-layered structure formed of a GaAs layer, an $\text{Al}_x\text{Ga}_{1-x}\text{As}$ ($0.4 \leq x \leq 0.7$) etch stop layer, and a GaAs current blocking layer,

in said multi-layered structure burying the ridge portion of said laser section of the first wavelength, an ammonia-based etchant is used for said GaAs current blocking layer and a hydrofluoric acid-based etchant is used for said etch stop layer to selectively etch said layers such that etching stops at respective underlying layers, and

the ridge portion of said laser section of the first wavelength exposed thereafter is buried in said insulative dielectric film having a low refractive index.